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# South Carolina's **FOURTH** Forest





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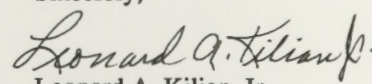
## **FELLOW SOUTH CAROLINIANS:**

Forests have always played a significant role in the life of South Carolinians. The many benefits that flow from the wooded acres that make up the predominant land cover of our beautiful state accrue to all our citizens, both rural and urban. Many who benefit take the enhanced quality and enjoyment of life for granted. However, those of us entrusted with the protection and development of the forest resources must not only redeem these responsibilities, but must also bring to the forefront and attention of each person the values of these benefits.

The publication of South Carolina's FOURTH FOREST report is part of that effort. The report is the culmination of many people's work and careful thought. Much of the report concerns itself with projections based on the best estimates of what will occur. The reality of the future can be very different from the "word pictures" printed in these pages. The result could be more disappointing, but hopefully the Fourth Forest will be more beneficial for our succeeding generations.

It has been said that "today is the first day of the rest of our lives." The challenge that this statement makes for renewed dedication and continued incorporation of new technology into our forest practices is great. Working together all of us can meet the challenge and make the future of forestry even better than today.

Sincerely,

  
**Leonard A. Kilian, Jr.**  
State Forester

The projections presented in this report are intended to indicate long term trends only. They were developed using three closely related computer models. The Timber Assessment Market Model (TAMM) produced estimates of roundwood harvest. Changes in timberland area and ownership were simulated with the Southern Acreage Model (SAM). The Timber Resource Inventory Model (TRIM) used this input to estimate regional changes in timber inventory, growth and removals. These regional projections were then allocated to each state using the State Allocation of Regional Inventory Model (SARIM). For additional information on these models and projections, refer to the USDA Forest Service Forest Resource Report No. 24, The South's Fourth Forest: Alternatives for the Future.

December 1988



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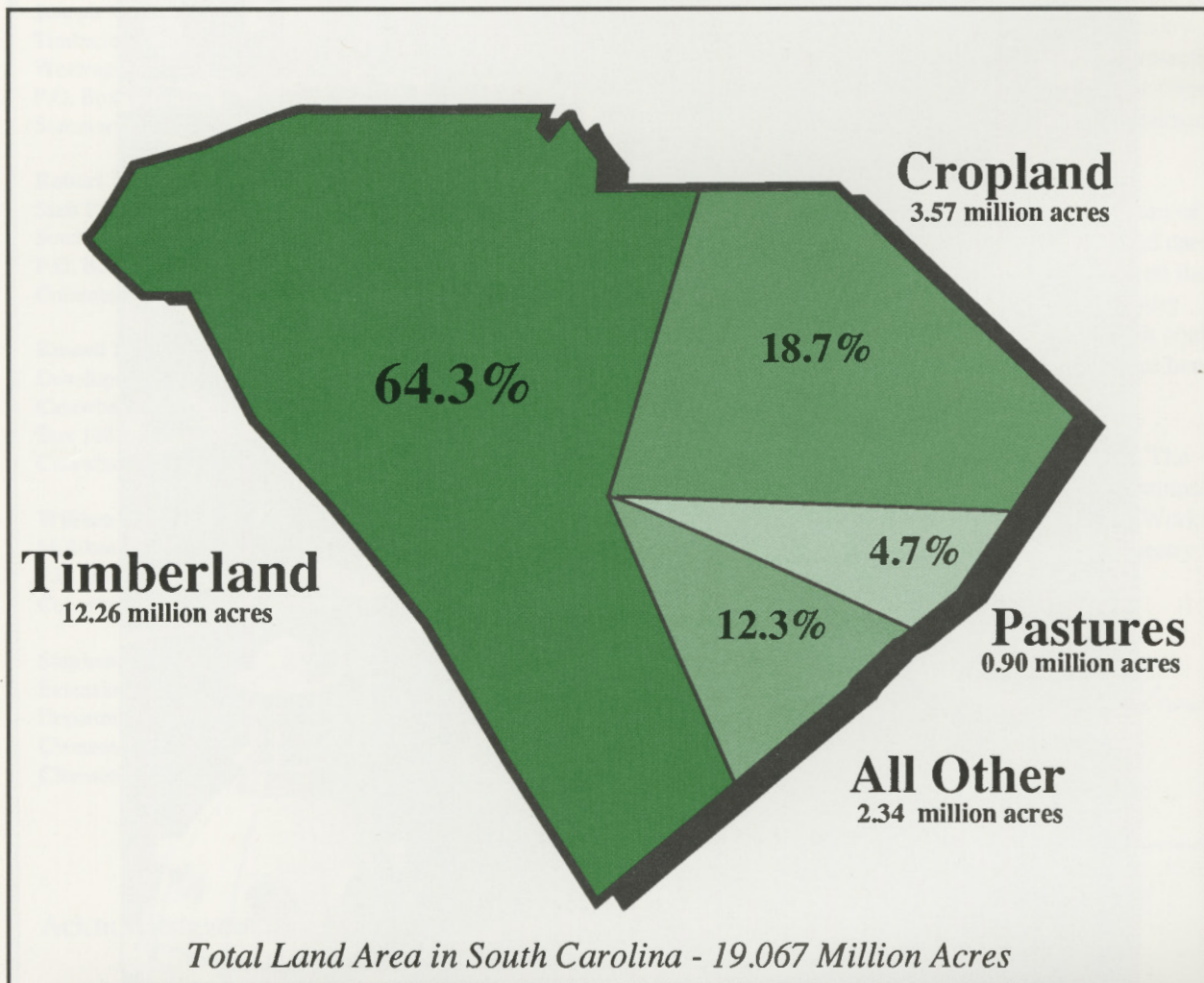
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*Decisions and actions taken a generation or more ago have shaped the forest of today - What kind of forest will develop as we enter the twenty-first century? What impact will it have on South Carolina's economy and society? This is the central focus of this report.*



# *What kind of forest*



*Today, 64% of South Carolina is forested !*



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# *will develop as we enter the twenty-first century?*

## **SOUTH CAROLINA'S FOURTH FOREST**

*Concurrent  
Resolution S.1070 of the Gen-  
eral Assembly of South Caro-  
lina, February 25, 1988-recog-  
nizes the importance of forestry  
to the State of South Carolina  
and the need to establish the  
development and management  
of our forestlands as a state  
priority as we approach the  
twenty-first century.*

### **THE FORESTS OF SOUTH CAROLINA**

Settlers coming to South Carolina saw the vast, original forest stretching from the foothills to the sea. This **first forest** they cleared for crops and pastures and to supply the lumber needs of a developing state and nation. Because of land clearing and uncontrolled fires in the early 1900's, only a

part of these cutover lands came back to trees. This was the **second forest** and it would supply the rapidly growing pulp and paper industry and other wood using industries from the 1930's through the 1960's.

Changes in land use began to have major impacts on South Carolina's forest situation. In the early 1920's, the use of land for crops and pasture had peaked and started to decline. Forest industry and government leaders became concerned because large areas of cutover forest land were not being regenerated. Their concern led to programs for fire protection, technical and financial assistance, research and education and the establishment of managed private, state and national forests.

The area of land used for crops and pasture continued to drop through the 1950's, sometimes at rapid rates. Some of this land was able to regenerate to trees naturally, due to increases in fire





*South Carolina develops it's future forest.*

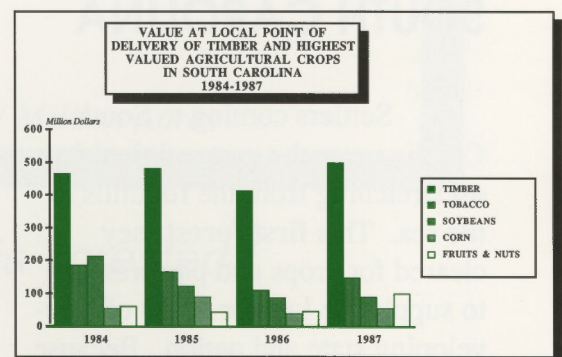
protection and educational programs associated with fire prevention. Forestry research led to more effective protection, regeneration, and management of existing forests and the utilization of southern pine timber for products such as pulp and plywood.

Decisions and actions taken a generation or more ago have shaped the forest of today — South Carolina's **third forest**. This forest is the source of wood used by the forest industries that are now such an important part of the economy of South Carolina. The third forest will continue to be the source of timber harvests until around the end of this century. In the same way, current decisions and actions will have important consequences decades from now as South Carolina develops its **Fourth Forest**.

## THE IMPORTANCE OF SOUTH CAROLINA'S FOREST RESOURCE

Today, 64 percent of South Carolina is forested. These forests provide forage for domestic livestock, habitat for wildlife, and protect vital watersheds. Of all the benefits associated with forests, however, timber is usually considered the most important in economic terms.

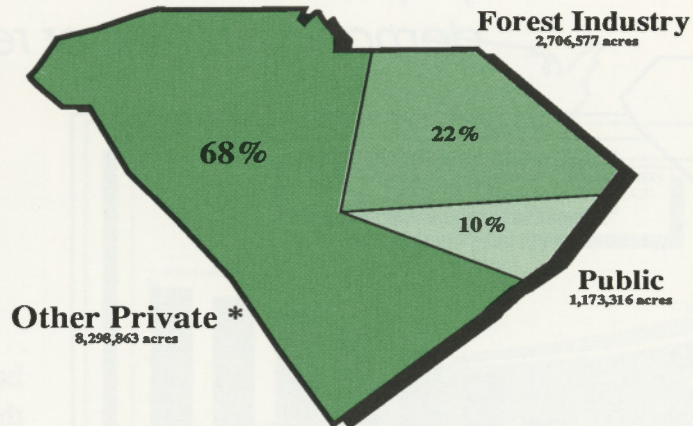
*Timber continues to be the leading cash crop in South Carolina with a value harvested in 1987 of \$502 million.*



*Timber is the leading cash crop in South Carolina.*



**Commercial Forestland  
in South Carolina  
by Ownership  
1986**



*\*Includes Farmers, Other Individuals and Corporations*

## PROJECTING THE FUTURE OF OUR FORESTS

Sixty-nine percent of this raw material for the state's forest industries is provided by 109,000 private woodland owners — owning sixty-eight percent or nearly 8.3 million acres of the forested land in South Carolina.

The projections for South Carolina presented in the body of this report are based on regional projections compiled by the U.S.D.A. Forest Service using computer models, and are intended to indicate long term trends only.

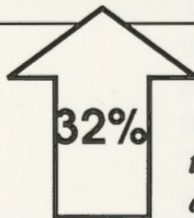
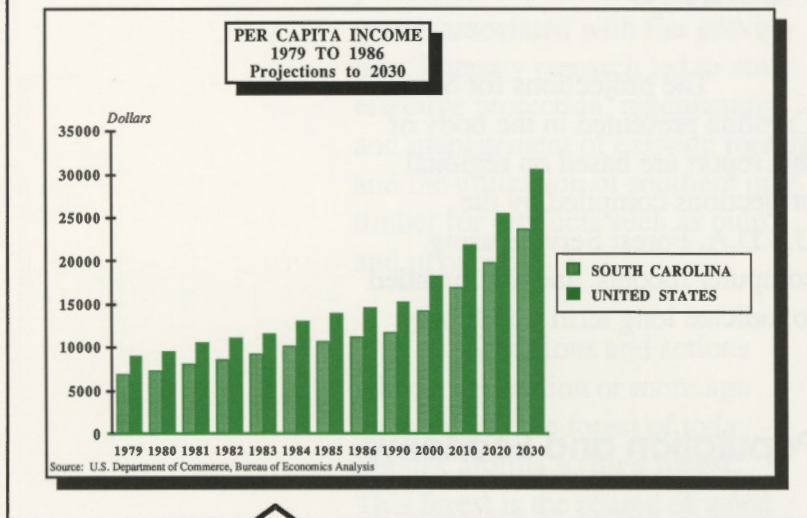
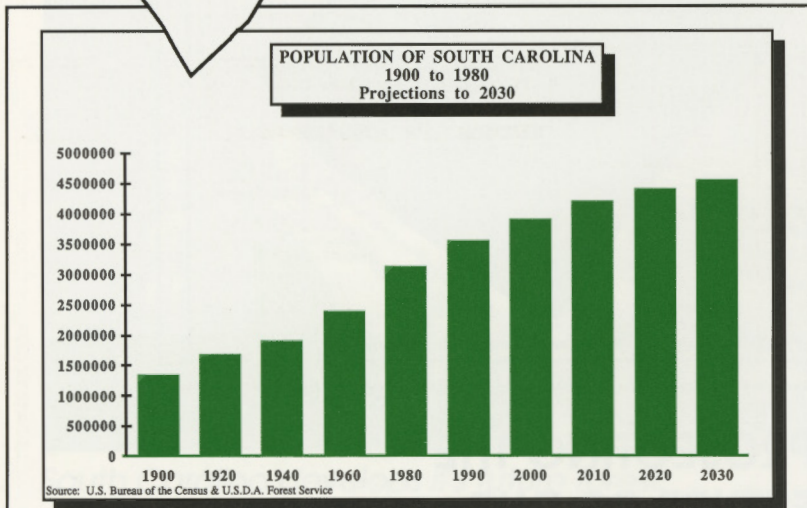
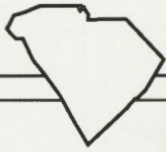
Forestry is the third largest manufacturing industry in South Carolina with more than 1,002 firms and 213 major manufacturing facilities. It contributes 4.3 billion dollars annually to the state's economy. In 1986, employment by forest industries exceeded 28,000 with wages and salaries totaling over \$628 million. The pulp and paper industry has the highest hourly wage of any manufacturing group in the state.

## Population and Economy

Population growth and changes in makeup affect the major timber products markets. Forestlands become targets for conversion to alternate uses, such as food and fiber production, recreation, and urban development.



*As population increases, so does demand on timber resources !*



*South Carolina's population is expected to increase by about 32 percent by the year 2030.* However, the rate of population growth is expected to decline. As a result, we can expect a dramatic increase in the number and proportion of people in the middle age classes. These are the people who

have the highest income and therefore generate the largest demand for goods and services.

The gross national product, a measure of the market value of all the goods and services produced in the economy, is projected to triple by 2030. Over the same period, per capita personal income is expected to double in the U.S., with South Carolina following suit. Thus, the burden on our future forest will include meeting the resource needs of a population one-third larger than it is today as well as the demands of *a population with far greater purchasing power than ever before.*

## The Demand for Forest Products

Total demand for roundwood products is anticipated to increase substantially by 2030. Pulpwood is expected to show the largest rise, with demand increasing 56 percent. Total demand for lumber is projected to increase rapidly until early in the next

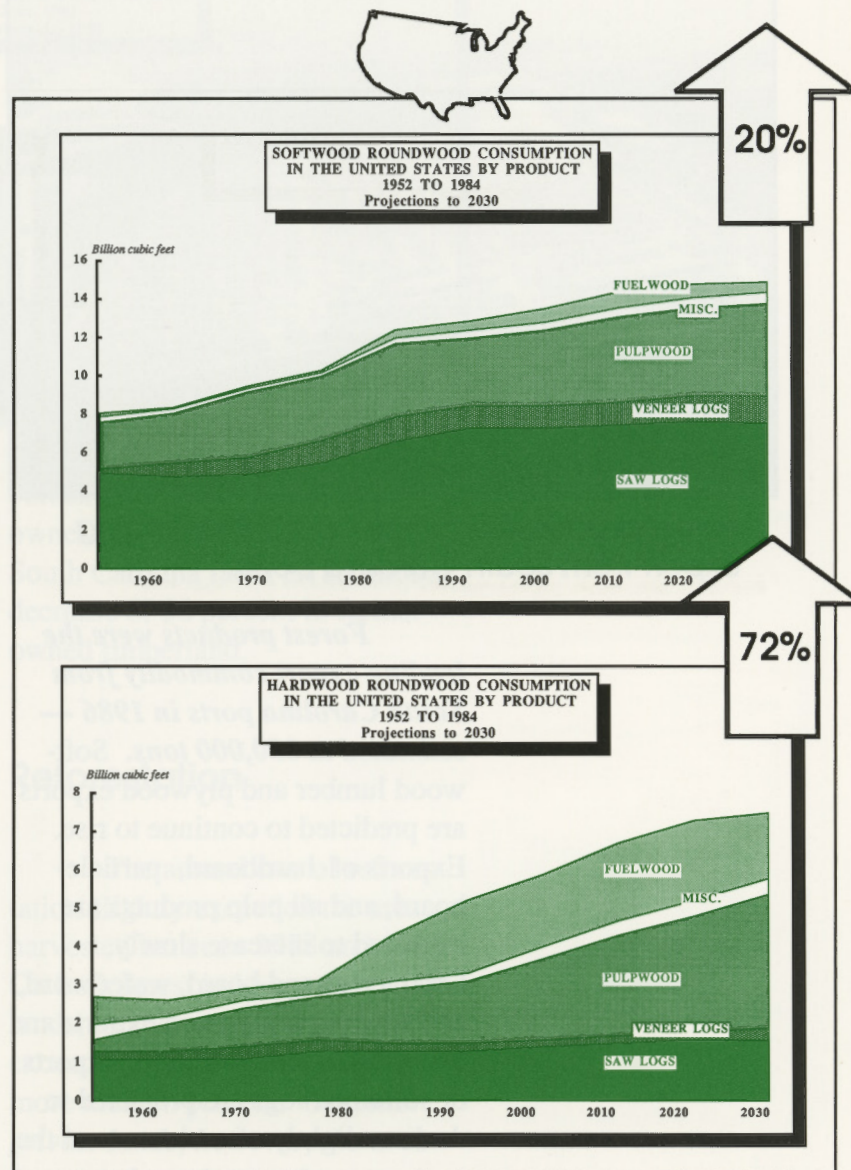


century. Then declining housing starts and a general slowdown in the economy will weaken the demand. Veneer log consumption is expected to rise slightly. Fuelwood consumption is expected to increase slowly, then drop rapidly to just above the current level, as competition increases for the available growing stock and as prices rise.

*Demand for softwoods is projected to rise 20 percent and hardwoods 72 percent. By 2030, about one-third of total demand is anticipated to be for hardwoods, compared to one-fourth of the total in 1984.*

## Imports and Exports

Currently the most important import commodity is softwood lumber, most of which comes from Canada. Perceptions are that the Canadian level of production cannot be sustained, and softwood lumber imports will decline. Conversely, hardwood lumber imports are expected to increase



slowly. Imports of pulp products have nearly doubled over the past thirty years and are expected to continue to increase.



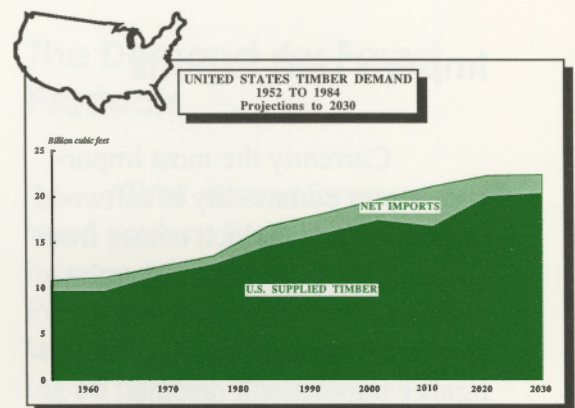


*Forest products continue to be the leading export from South Carolina ports.*

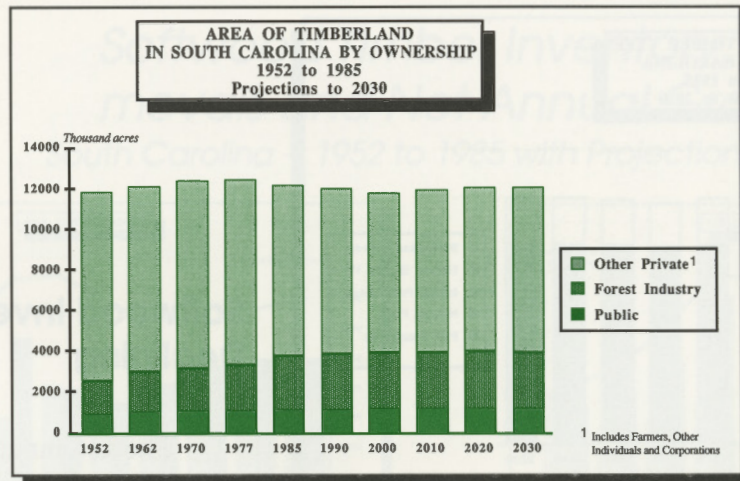
***Forest products were the leading export commodity from South Carolina ports in 1986 — estimated at 850,000 tons.*** Softwood lumber and plywood exports are predicted to continue to rise. Exports of hardboard, particleboard, and all pulp products are expected to increase slowly. Oriented strand board, waferboard, and hardwood plywood exports are expected to remain small. Exports of softwood logs are projected to decline slightly after the turn of the century.

Total imports are expected to rise 12 percent by early in the next century, then fall to just above the current level. Projected total exports are expected to increase about 14 percent. Overall, projections show a modest overall decline in net imports at the end of the projection period.

Because domestic and export demands are predicted to increase rapidly over the next four and a half decades, while net imports decline slightly, demands on U.S. timberland are expected to increase by a substantial 39 percent. ***In the future the United States must look to its domestic timber supply to meet a larger share of its demand for timber products.***







## Timberland Area

Since 1978, the area of timberland in South Carolina has declined by nearly three percent, and now totals 12.3 million acres. Nearly half of the gross timberland reduction was due to the clearing of timberland for urban and related uses. This loss was only partially offset by non-forestland added to the timberland base through reversions. This trend is expected to continue, with the total timberland area declining to 12.1 million acres by 2030.

Over the past 10 years, timberland under forest industry control increased 16 percent and is projected to rise about two percent each decade.

Private forest owners control nine percent less acreage than they did a decade ago. Within this group, private individuals other than farmers control 17 percent more timberland. Farm timberland ownership dropped 30

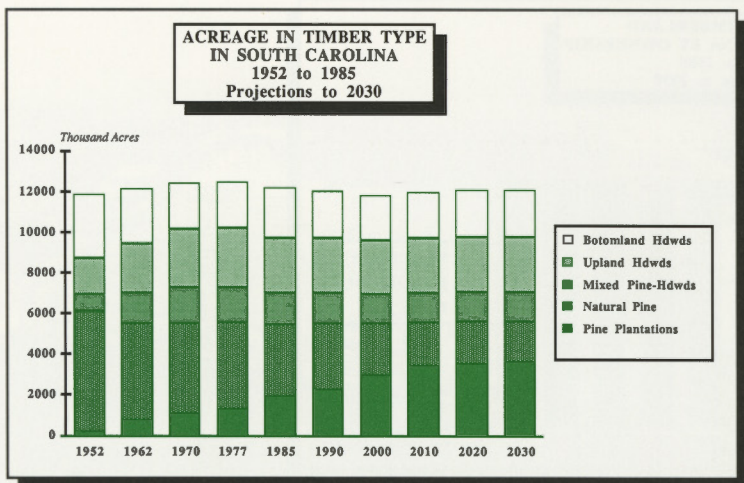
percent. Following projected ownership trends for the South, South Carolina faces an additional decrease of 30 percent in farmer owned timberland.

## Reforestation

The annual rate of reforestation slightly exceeded the area harvested between 1978 and 1986. On both forest industry and public lands, total area reforested annually exceeded the area harvested by more than 10 percent. *On other private lands, however, the area harvested yearly was three percent greater than the total area reforested.*

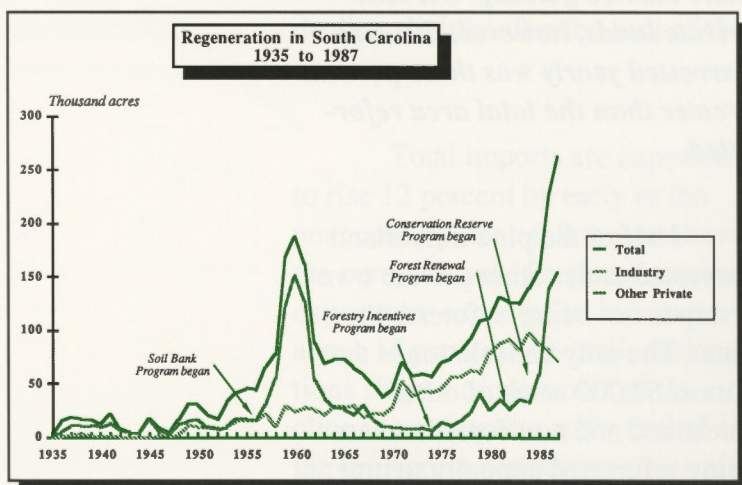
Half of the pine timberland harvested under other private ownership is not being reforested to pine. The only consolation is that almost 58,000 acres of other forestland and non-forestland are being reforested annually to pine, keeping the acreage of pine harvested and that reforested almost in





balance. Since 1978, the area of pine plantations increased by almost 650,000 acres. This trend is expected to continue with the area in pine plantations increasing 87 percent with increases occurring across all ownerships.

Since 1978, the annual rate of planting has increased by 68 percent statewide, with planting on other private ownerships increasing one hundred forty-three percent.



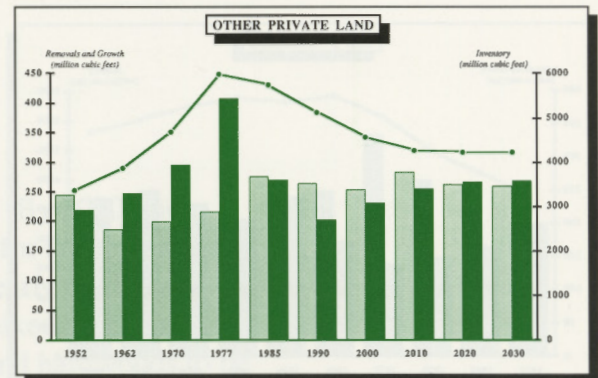
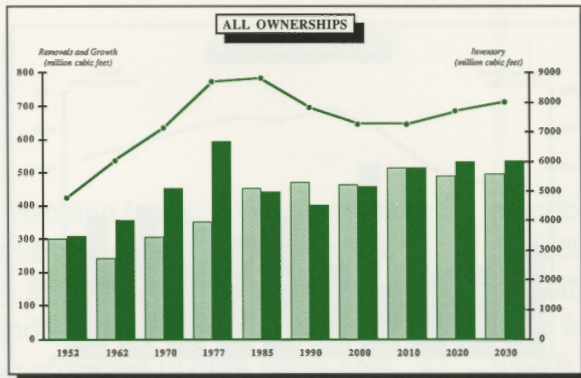
## Softwood Inventories Declining

The net annual growth of softwood growing stock dropped 28 percent from 1978 to 1985. Although all ownerships showed reductions, 88 percent of the loss can be attributed to declines on other private ownership land. Four major causes of the decline in net growth have been identified:

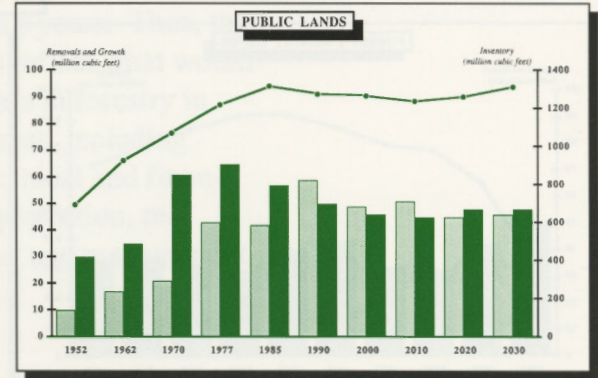
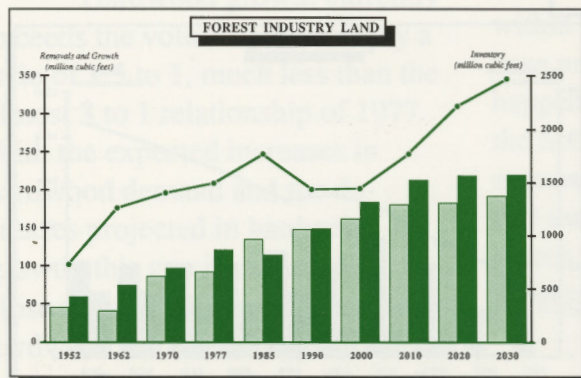
- 1 Inadequate pine regeneration on other private land following harvest;
- 2 Sharp increase of annual mortality due to pine bark beetles and diseases;
- 3 Decline in area of timberland due to conversion to urban and other related uses;
- 4 Reduction in the rates of tree diameter and stand basal-area growth. Possible causes include increased stand density and age, drought or other weather factors, increased hardwood competition and atmospheric deposition.



# Softwood Timber Inventory, Re- movals and Net Annual Growth South Carolina -- 1952 to 1985 with Projections to 2030



■ Timber removals  
■ Net annual growth  
● Inventory



These reductions in growth are expected to continue through 1995. Then softwood growth is projected to turn back up. This is due to expected increases in timberland area and the anticipated growth from trees in young plantations that reach merchantable size.

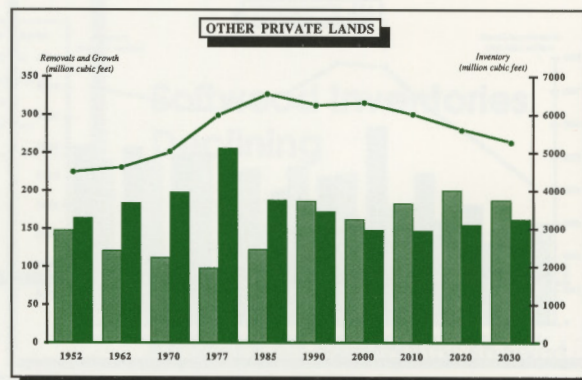
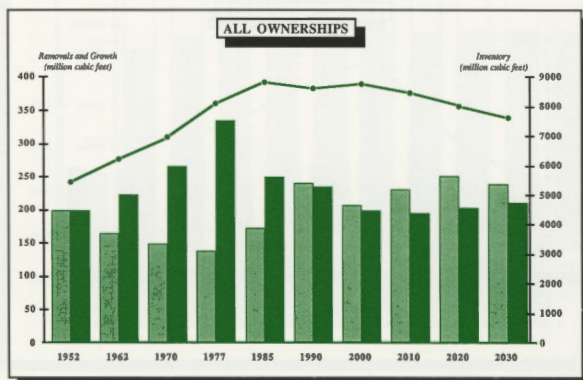
Harvests of softwood growing stock have increased 26 percent since 1977. Predicted future demand for timber products

will require that annual removals of softwood growing stock increase 10 percent. Almost all of this increase will come from forest industry lands.

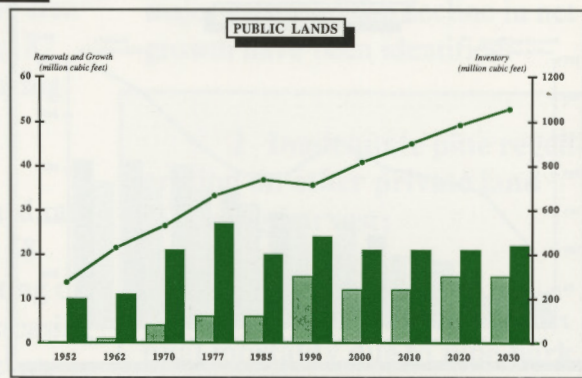
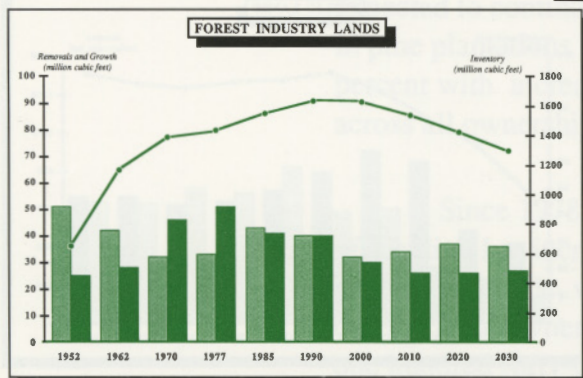
Softwood growing stock inventory peaked in the late 1970's, declined, and is expected to continue dropping. By 2010, projected slowdowns in harvests and growth increases will cause softwood inventory to rise again.



# Hardwood Timber Inventory, Removals and Net Annual Growth South Carolina -- 1952 to 1985 with Projections to 2030



■ Timber removals  
■ Net annual growth  
● Inventory



## Increased Demand For Hardwoods

Hardwood growth declined twenty-eight percent between 1977 and 1985 and is projected to decline another 21 percent by early in the next century. Hardwood mortality has increased nearly 50 percent since 1978, reducing potential net growth. But as mature stands are harvested within the

next thirty years, hardwood growth is projected to turn up.

The harvest of hardwood growing stock increased by 27 percent from 1978 to 1985, and is anticipated to increase more than thirty-nine percent over the next thirty years. Currently, 27 percent of all removals are hardwoods, but this is expected to increase to 39 percent by 2030. The greatest increase will be on other private



ownership lands, where hardwood removals are projected to increase by 55 percent. Conversely, hardwood removals on industry land are projected to drop about 16 percent.

Hardwood growth currently exceeds the volume harvested by a ratio of 1.5 to 1, much less than the almost 3 to 1 relationship of 1977. With the expected increases in hardwood demand and the decreases projected in hardwood growth, this gap is expected to close rapidly. Within the decade, hardwood removals are projected to exceed growth. The volume of hardwood growing stock harvested is expected to exceed growth by 24 percent before the gap begins to close in 2020.

## **ECONOMIC IMPLICATIONS OF THE PROJECTIONS**

The projections presented above are the product of a level of timberland management that is much more intensive than that

practiced today. By 2030, the projections call for the area in pine plantations to nearly double and large areas of mixed pine-hardwoods and upland hardwoods to be converted to pine. Planting or conversion of these areas to pine will require large investments within the next 15 years. Thus, the base projections reflect what would happen if progress in forestry in the South continues, including expansion in technical and financial assistance, protection, research, education and management programs.

## **Stumpage and Lumber Prices Increase**

Between 1984 and 2000, a time in which net annual softwood timber growth and inventories decline, there will be a substantial increase in real softwood stumpage prices (prices net of inflation or deflation). Softwood sawtimber stumpage prices are projected to increase 4.4 percent per year during this period and then rise more slowly from 2000 to 2030.



## Hardwood Timber Inventory, Removals and Net Annual Growth South Carolina — 1935 to 1984 with Projections to 2030

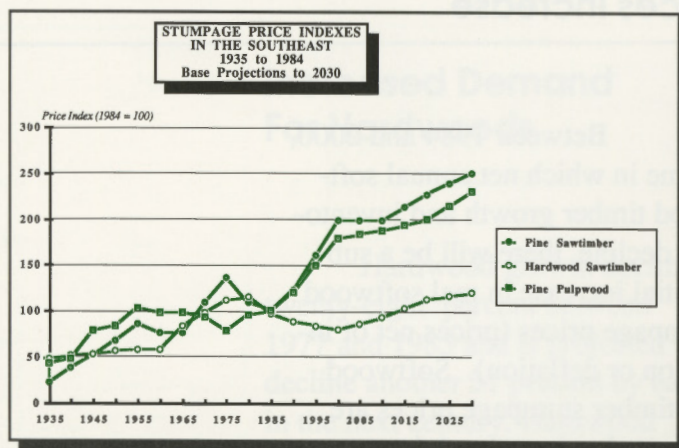
Softwood pulpwood stumpage prices are projected to increase roughly at the same rate as sawtimber stumpage until 2000. Pulpwood stumpage prices increase slowly during the next two decades. By the decade from 2020 to 2030 they are projected to increase approximately two percent per year.

Hardwood sawtimber stumpage prices show much different trends from those for softwoods. They decline until 2000 due to large and increasing inventories of hardwood timber. After 2000, as timber removals rise

above net annual growth and inventories begin to decrease, prices begin to rise. In the last two decades of the projection period, they are expected to go up at a rate of 1.2 percent per year.

These projected increases in hardwood sawtimber stumpage prices are for the smaller, lower quality hardwood timber that compose the bulk of the hardwood timber inventories. The stumpage price outlook for larger hardwood timber of preferred species, such as select white and red oak, walnut, and black cherry, is different. Removals of higher quality sawtimber of most preferred species have been close to or above net annual growth and there have been large increases in stumpage prices in the past. This situation seems likely to continue.

The projected increases in softwood and hardwood lumber prices are similar to those for stumpage. Softwood lumber prices go up at a 1.7 percent annual rate



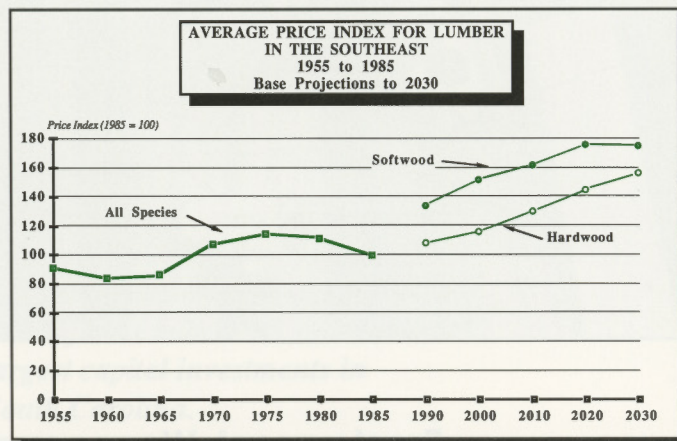


in 1980's and 1990's but slow down over the rest of the projection years. Hardwood lumber prices show an opposite pattern, rising slowly in the early years and at increasingly faster rates in the later years.

Rising product prices constrain the demands for wood products and in turn the demand for timber. They also have broader impacts on the economy, society, and the environment. Everyone uses wood products in some form. The greatest losses from rising real prices of stumpage will be sustained by consumers. Home buyers will be the most affected. The projected increases in prices, for example, will cause a reduction in the number and average size of homes built, especially in the latter part of the projection period.

As timber prices rise, there will be an acceleration in the use of nonrenewable resources, particularly fuel and metal minerals. There will also be rising environmental costs, chiefly from larger emissions of air and water pollut-

ants resulting from the added mining, industrial processing, and power generation associated with the greater use of substitute materials.



*Economics will cause a shift from woodbased products to non-renewable resources.*

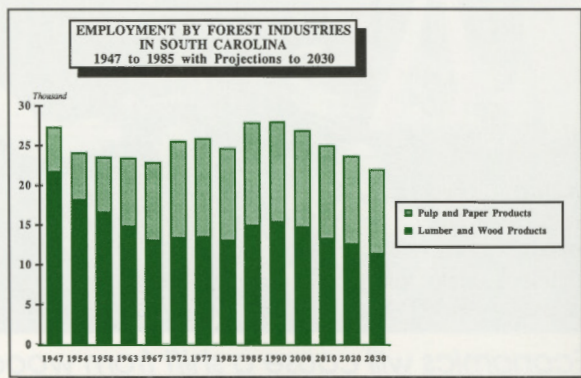


# EMPLOYMENT, WAGES AND SALARIES IN THE FOREST INDUSTRY



## Employment, Wages and Salaries in the Forest Industries

Regional projections of employment in the forest industries show large declines from 1990 to 2030. During this period, employment in the lumber and wood products industry drops by 22 percent and by 17 percent in pulp and paper products industry. By 2030, employment in both industries falls by 21 percent.

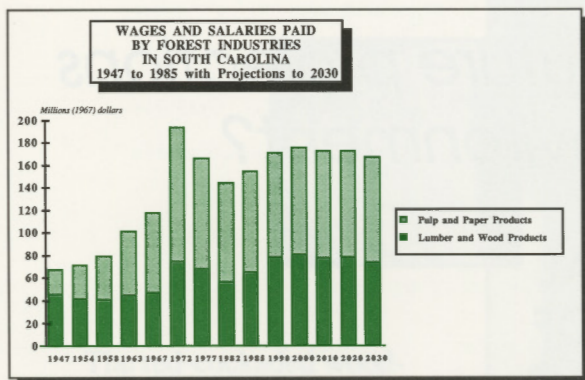


These downward trends are a reversal of the increases that have taken place in recent decades. The projected rise in timber supplies (harvests) will not be large enough to sustain the historical trends. *Rising productivity per employee overrides the projected increases in harvests.*

On the other side, rising productivity is passed on as higher wages and salaries per employee. As a result, total wages and salaries (in constant dollars) for both industries increase for a while, although at much slower rates than over the past 30 years. Beyond 2000 even these modest increases cannot be sustained and total wages and salaries also begin to decline.

The projected drop in employment, wages and salaries is of great economic significance. The effects will be multiplied as unemployment spreads through areas of the state's economy that provide goods and services to the





forestry sector. It is currently estimated, for example, that the loss of one job in the lumber and wood products industry would result in a decrease of 1.8 jobs throughout the state's economy. A loss of one job in the pulp and paper products industry would be multiplied 2.8 times as other parts of the economy are affected.

## Investments in Plants and Equipment

From 1980 to 1988, capital investments by forest industries, totalling over 3.8 billion dollars, accounted for more than twenty percent of all industrial in-

vestments made in South Carolina. *For five out of the last eight years, forest industries made the largest capital investments in South Carolina.*

Additional investments will be needed through the projection period to maintain existing plants and equipment and add the capacity necessary for processing the increased volume of timber harvested. Roughly 95 percent of this investment will be in the pulp and paper industry due to the higher costs of plants and equipment used in the manufacture of pulp and paper.

YEAR	COMPANY	ANNOUNCED CAPITAL INVESTMENT	
		INVESTMENT	
1981	Union Camp	\$600 million	New Paper Mill
1982	International Paper Co.	\$500 million	Modernization of Paper Mill
1984	Bowaters	\$341 million	Paper Mill Expansion
1985	Stone Container	\$100 million	Cogeneration Plant
1988	Willamette Industries	\$300 million	New Paper Mill
1988	Union Camp	\$700 million	Paper Mill Expansion
1988	International Paper Co.	\$ 50 million	Paper Mill Expansion



## *What do these future projections mean to the environment?*

### ENVIRONMENTAL IMPLICATIONS OF THE PROJECTIONS

South Carolina's forests provide sites for recreation for millions of people. According to the *1985 National Survey of Fishing, Hunting and Wildlife-Associated Recreation*, over 70 percent of the population participates in wildlife-related activities such as observing, photographing, or feeding wildlife. Nearly one-third of the population engages in hunting or fishing. Projected changes in land use and in the timber resource start a complex system of changes in the natural environment and natural resources other than timber.



*The forest provides recreational opportunities for future outdoorsmen.*

### Wildlife

By 2030, the population of white-tailed deer, an important southern game species, is predicted to decrease. This will be due to the decline in available habitat as forested acreage is converted to human uses, especially urban and road development. Associated increases in hunting and other human-related disturbances will also raise deer mortality.

Wild turkey populations also show a small decline over the projected period. This species has more specific habitat requirements than deer and is closely tied to the hardwood management types. The projected decline in the area of upland hardwoods, the conversion of natural pine and oak-pine to pine plantations, urban development, and other human related disturbances will be major factors in this decline.





The red-cockaded woodpecker has highly specialized habitat needs. It requires old-growth pine stands for nesting and survival. It does not appear likely that many old-growth pine stands of sufficient size to support colonies will be maintained on private lands. Thus, the number of red-cockaded woodpecker colonies is predicted to drop. Most of these remaining colonies will be on federal or state lands, especially the national and state forests.

Trout populations too will drop over the projected years. This drop, again, largely reflects a decrease in the older age classes of hardwoods (over 50 years) and an increase in areas of intensive human-related use.

***The population of these species could be maintained or increased through more intensive management, increased technical assistance to private timberland owners and better enforcement of game laws.*** Restocking of suitable habitat, leaving buffer strips along streams and longer rotations will



*The forest helps to provide a plentiful supply of clean water.*

also favor turkey, trout and red-cockaded woodpecker populations.

## Water Quantity

Annual water yields or runoff is predicted to increase by a half inch or 3 percent. Most of the increase takes place by 2000. This increase in water reflects land use changes, especially the increase in the area of urban land and the decrease in timberland. Further shifts from timberland to urban use, and to crop and pasture use, would result in additional increases in water runoff. However, the South is experiencing rapid declines in groundwater levels due to withdrawals for irrigation and domestic water supply. Such shifts would probably result in less groundwater recharge.

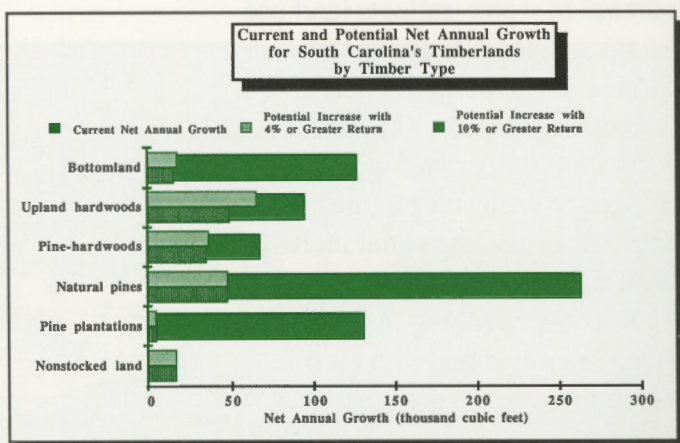


*"It is common sense, and not fantasy to invest money in tree crops just as much as to grow annual agricultural crops. The return on the investment is just as certain in the case of growing trees as it is in the case of growing potatoes or cotton, or wheat or corn--and judging by present day fluctuations in the prices of agricultural crops, in the tree is often a safer investment."*

*Franklin D. Roosevelt*

## ECONOMIC OPPORTUNITIES

If economic growth in the forestry sector, in employment and in wages and salaries is to be sustained in South Carolina, it will be necessary to greatly increase timber supplies. Opportunities to increase timber supplies exist on stands that are poorly stocked, have competing vegetation, have offsite species, are overmature, or are in some other less than productive condition.



Data collected as part of the inventories of the forest resources of South Carolina show that there are 4.15 million acres needing treatment, and of those, 3.54 million acres could earn four percent or greater real rate of return. The average cost to treat these acres is \$86, and the average increase in yield would be 55 cubic feet annually. The total investment required is \$305.9 million to produce an annual growth increment of 194.7 million cubic feet.

About 3.15 million of the 4.15 million acres in South Carolina needing treatment could earn a ten percent or greater real rate of return on the investments made to improve their productivity. Treatment of these high-return acres would require \$274.3 million. This investment would increase timber growth by 175.1 million cubic feet each year or approximately 56 cubic feet per acre per year.



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## THE CHALLENGE

### OPPORTUNITIES TO INCREASE NET ANNUAL GROWTH ON MARGINAL CROPLAND AND PASTURE

In addition to the opportunities on timberland described, there are large potential timber production opportunities on marginal cropland and pastures, including highly erodible cropland.

In South Carolina, approximately 745,000 acres of cropland and pastures could earn greater returns in pine plantations. If planted to pine, these acres would yield about 70.3 million cubic feet of additional timber growth per year or about 94 cubic feet per acre per year. This volume greatly exceeds the current net annual growth on pine plantations in South Carolina which is 65 cubic feet per acre per year.

*Planting of marginal cropland and pasture sites to pine is the most profitable investment option identified in South Carolina, even without cost-share payments, because only minimal site preparation is needed. The average cost of establishing these pine plantations is much below that on harvested timberland — \$57 per acre compared to \$124 per acre. Planting marginal lands to pines also offers the most extensive and cost-effective opportunity for expansion of softwood timber supplies.*

If all of the marginal cropland and pasture acres were allowed to revert naturally to forest cover, about 23.1 million cubic feet of timber would eventually be produced per year. This growth amounts to an average annual production of about 31 cubic feet of timber per acre, but the direct investment cost would be nil. These estimates include assumptions that 70 percent of the sites would revert to pine and 30 percent to upland hardwoods.



*"It is common sense, and not fantasy, to invest money in the right place as much as to grow normal agricultural crops. The return on the investment is as certain as the money growing there as it is in the case of growing potatoes or cotton, or wheat or corn—just waiting for market day. Furthermore, the price of agricultural crops is far less than the price of timber."*

*—Walter D. Russell*

Timber production opportunities on highly erodible cropland, included in marginal cropland and pasture, were also examined separately. Estimates of highly erodible cropland acres were based on initial target figures from the Soil Conservation Service on acres in South Carolina that would qualify for the Conservation Reserve Program (CRP) and would be suitable for planting to trees.

There are approximately 299,000 acres in South Carolina that may be classified as highly erodible cropland suitable for planting to trees. Most of these acres would be highly productive timber sites, and returns from pine plantations could match or exceed long-term earnings from crops. These acres have been targeted by the Conservation Reserve Program. Through six sign-ups, 164,390 acres of highly erodible cropland have been enrolled in this program and have been, or will be, planted to pines.

More than 32.3 million cubic feet of timber could be

produced annually on these acres. The capital investments needed to plant pine on these acres would total about \$18.8 million dollars. The financial returns on these acres would range from 11 to 15 percent when not including CRP cost-share or rent payments.

In summary, net annual timber growth in South Carolina could increase by 70.3 million cubic feet if pine plantations were established on all of the marginal cropland and pasture including the highly erodible land. ***This total is a third of the net annual growth potential from utilizing all of the economic opportunities on timberlands.***

Taken together, opportunities on timberland, cropland, and pasture could increase net annual growth in South Carolina by 265 million cubic feet. Most of this increase would be pine growth. This would represent a 38 percent increase in current net annual growth for all species in South Carolina and represent a 62 percent increase in current net annual growth for pine.



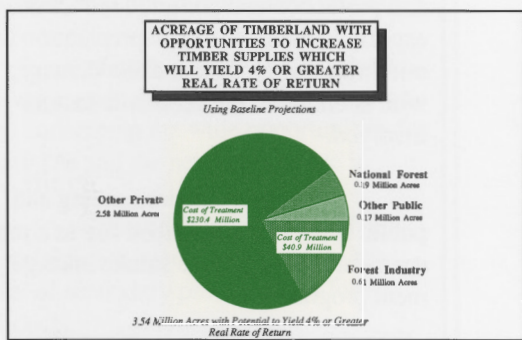
# THE CHALLENGE

It is evident that many opportunities do exist regarding investments in timber management practices that will yield good rates of return and result in major increases in South Carolina's and the nation's timber supplies. With the implementation of these economic opportunities on timberland, marginal cropland and pastures, it would be possible to sustain indefinitely the forestry sector in South Carolina, including employment and wages and salaries. But only part of these opportunities are likely to be realized. Studies prepared in the late 1960's and the late 1970's and the analysis above, show that opportunities continue to be under utilized.

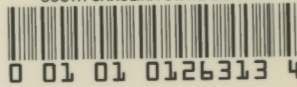
Nearly three-quarters of the investment opportunities are on lands of the other private owners (farmers, other individuals and corporations). These owners have widely diverse objectives and attitudes; limited technical knowledge of the ways timber stands should be harvested, regenerated,

and managed; and a varying willingness and capacity to make investments in management practices.

Ownership tenures for this group are typically short, and most owners are in the older age groups. Thus, for most treatment opportunities, especially regeneration where the time between investments and harvest is long, there is little likelihood that direct benefits, such as income from timber harvest, will accrue to current owners.







# Recommendations

## INCREASE PUBLIC AWARENESS

of the value of the forest resource in providing clean water, wildlife habitat, recreational opportunities and timber and of the role of forest management in maintaining a healthy, productive, forest resource.

--Increase public awareness of the forest resource as a source of material necessities and the contribution of the forest and forest industry to state and local economies and community well-being.

—Develop demonstration areas or experimental forests to show examples of forest management, wildlife management, and urban forestry, and to provide environmental education.

—Give priority to research and technical transfer on the advantages of soil protection and pollution reduction, especially methods of site preparation that minimize soil erosion and site damage, with attention to the economic factors involved.

—Increase understanding and public support of prescribed fire as a management tool. Improve smoke management programs.

—Increase public awareness and support for efforts to control the Southern Pine Beetle. Consider the use of programs similar to those used for fire prevention and suppression. Stress the importance of control efforts when pine beetle populations are at endemic levels

and for appropriate control efforts on all forestland, including wilderness and other reserved areas.

—Provide multiple benefits that enhance the quality of life through forest management. Utilize the forest resource to produce wildlife habitat, recreational opportunities, clean air and water, as well as timber, with a minimal impact on the environment.

—Support research to quantify the adverse effects of air pollution on forests and other renewable resources, and efforts to reduce these emissions.

## INCREASE TIMBER SUPPLIES

in order to meet future demands and maintain the high economic benefits of forestry to the state.

—Encourage thinning of overcrowded stands, the salvage of dead and dying timber, and more intensive management of natural stands in order to increase growth rates.

—Reduce losses from forest fires by increasing fire prevention and fire law enforcement activities to reduce wildfire occurrence.

—Reduce losses to insects and diseases by facilitating the transfer of quotas where disasters such as the Southern Pine Beetle, ice storms, and tornadoes necessitate the prompt harvest of timber. Find ways to make harvests more practical for thinning of young stands and salvage of insect infestations.



# *for the forest of the twenty-first century.*

—Provide additional cost-share funding for reforestation, planting erodible cropland and pastureland, and other needed silvicultural activities such as cut and leave for Southern Pine Beetle control.

—Support changes in state and federal tax laws that would provide a more favorable tax climate for forest management.

## **PROMOTE TECHNOLOGY TRANSFER AND RESEARCH** to

inform and motivate landowners to wisely manage the forest resource for increased timber supplies, wildlife and other benefits, and the economic returns.

—Intensify hardwood management and regeneration research, and promote the management of hardwood stands.

—Research low cost ways of naturally regenerating and direct seeding pine and other desirable species, and provide this information along with other management alternatives prior to harvest.

—Expand technical assistance programs by state forestry agencies, forest industry, and consultants to provide personal assistance by a professional forester to private landowners before harvest decisions are made and at other critical points in the management process.

—Build technology transfer and research initiatives into the research process and focus more effort on the diffusion of research results. Ties between extension and research groups, including Forest Service, universities, and industry, should increase emphasis on technology transfer.

## **DEVELOP AND PROMOTE MARKETS** for current and new wood products and attract secondary wood processors to the state.

—Investigate new alternatives for promoting forestry and wood products in South Carolina and determine the best promotional program including sponsoring groups or agencies to exploit opportunities.

—Identify potential markets for different wood products or new products.

—Educate architects, engineers, builders, and others involved in construction concerning the wide opportunities for wood use and the need to promote it.

—Establish initiatives with appropriate state agencies to increase the level of secondary processing of forest products.

—Identify the primary and secondary products being exported or shipped out-of-state in order to identify opportunities for additional in-state processing.